



# Zephyr HALE UAS

(High Altitude Long Endurance Unmanned Aerial System)



European Command & African Command  
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# Zephyr Video

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# Zephyr Programme Objective

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## **Design a HALE UAS to fly for months at a time:**

Solar powered to provide 3+ months flight endurance

Solar charged batteries provide power throughout the night

Operating altitude 50,000 - 70,000ft (global minimum wind speed altitude)



### **Platform:**

Lightweight (100lbs and 75ft wingspan) very low drag (aerodynamically efficient)

Scaleable concept, platform size is essentially unlimited

### **Control:**

Autonomy through flight control, including waypoint navigation

SATCOM enabled command and control

## **Payload capacity nominally 6lbs and 50W (15W night), for example:**

Vis/IR imagery and real-time video to 50cm resolution from 50kft

Multi-channel comms relay - SINCGARS

Electronic Surveillance, Direction Finding

Heavier and/or more power hungry payloads can be supported with small impact on flight profile



# Zephyr Programme Update

## **Enabling contract in place between NavAir and QinetiQ:**

As of May 2009

For training, demonstration and additional platform procurement as funding is realised

## **System training for NavAir:**

Initial funding now in place

Simulator training to begin in UK in June 2009

Flight training continues at YPG in July 2009

## **MOU signed between US DoD and UK MOD:**

MOD loan to DoD of Zephyr platforms and GCS

Mutually beneficial open-ended joint program for:

- Training and payload assessment
- Demonstration (possibly including overseas)
- Continuing platform capability development
- Ultimately leading to Low Rate Initial Production (LRIP)



# US JCTD 2008 (Joint Capability Technology Demonstration)

## Flight #1

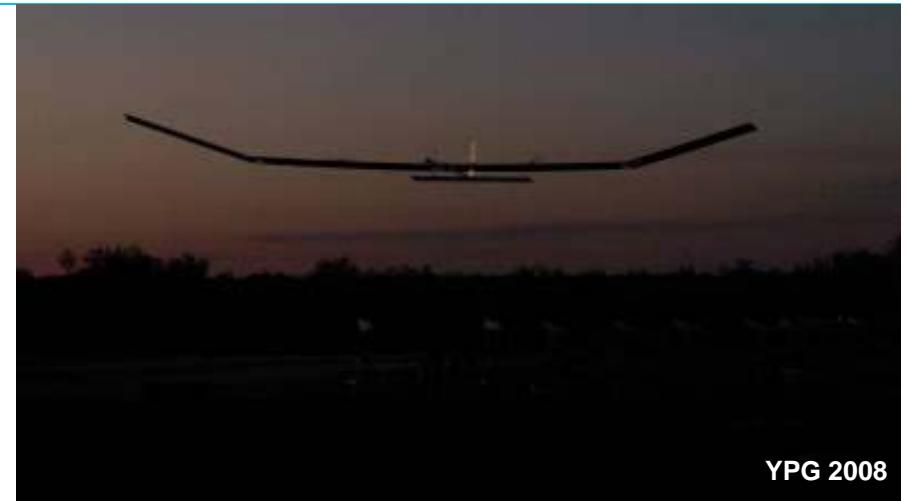
82hr flight duration

62,000ft altitude achieved

Payload assessment

## Flight #2

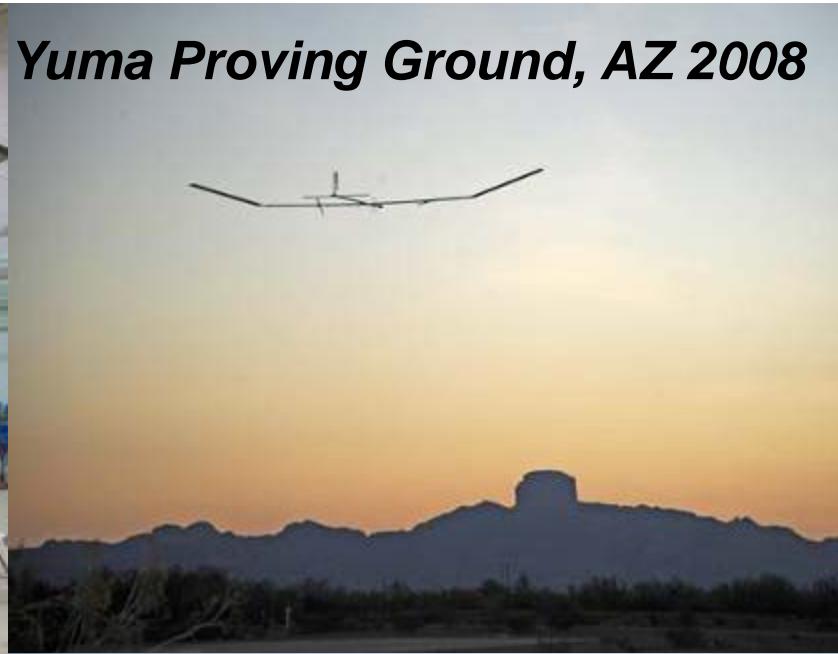
Payload check flight at 17kft flight altitude



Comms relayed San Diego to Phoenix

Autopilot performed flawlessly both flights





***82hr flight duration  
- unofficial world record***



# Demonstrated Communications Payloads

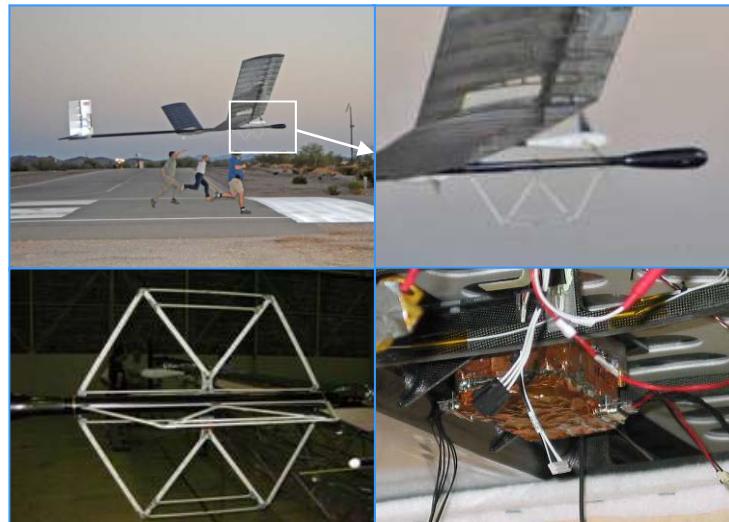
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## Summer 2006

Cross Band UHF-VHF repeater (AN/PRC-112G transceiver) used for CSAR and SF missions

Mass 1lb

Operated at a range of > 130 miles at c15-20Kft



## Summer 2008

Dual channel SINCGARS VHF

Mass 6lbs

Operated at a range of > 300 miles at c17kft

# Potential Zephyr Contribution to AFRICOM AOR

## AFRICOM region

Large areas leading to widely distributed assets

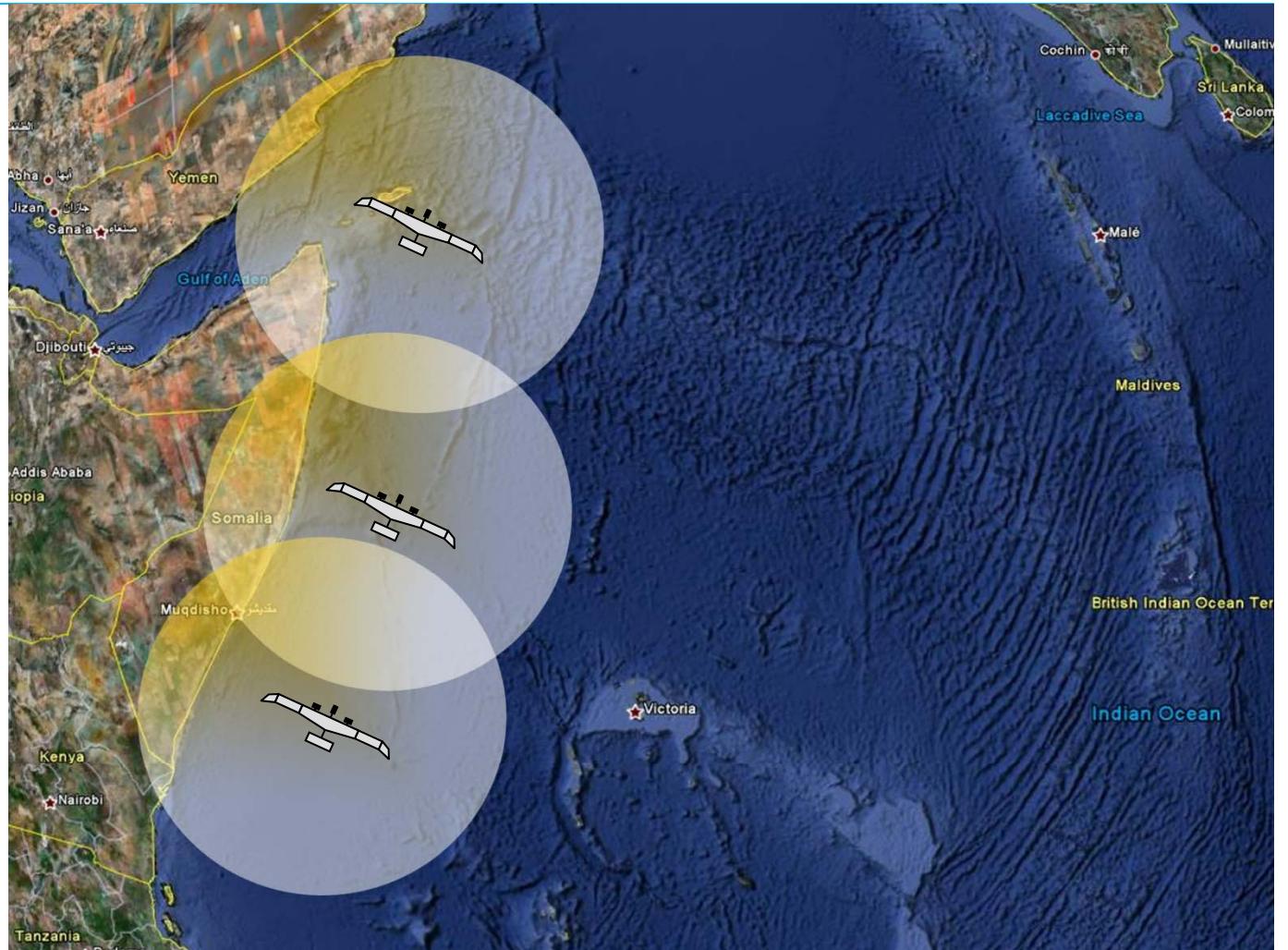
Zephyr provides constellation coverage

Low cost and low manpower footprint

Communications relay

SIGINT / ELINT

Maritime surveillance



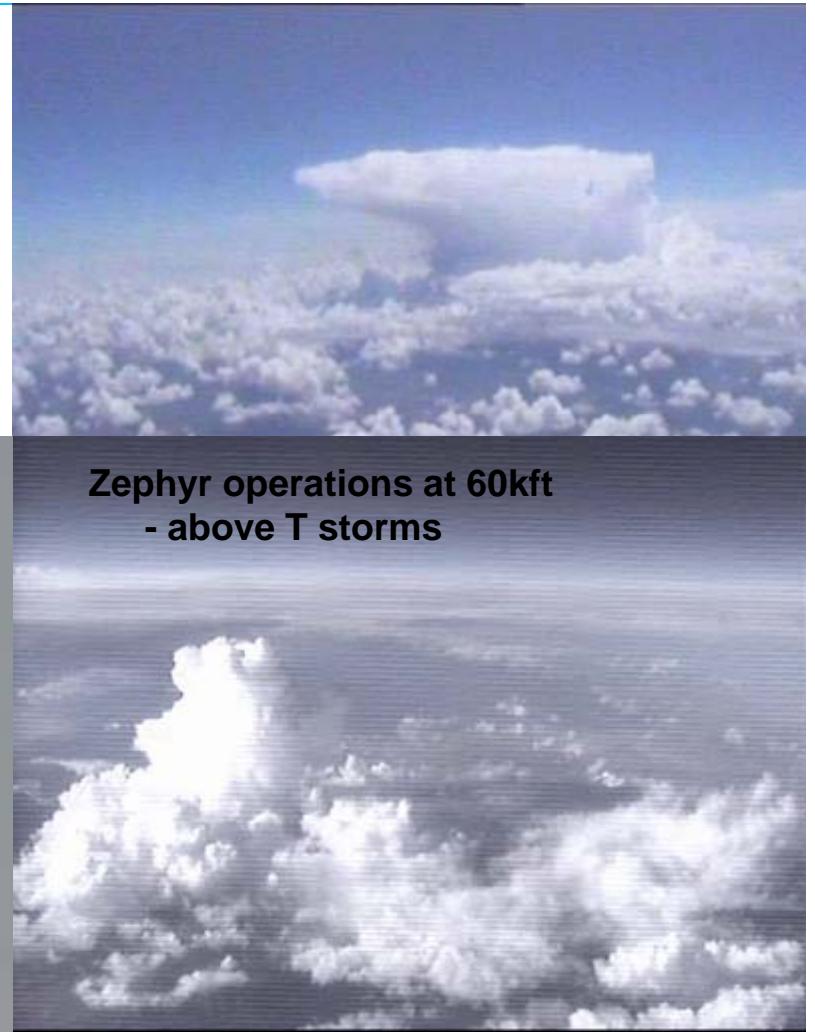
# Zephyr upgrade program

Power usage efficiency improvements

Greater payload volume

Extend flight duration to 3 months – 2010/11

Demonstrator already flying in UK



## Operating Zephyr in theatre

**Ship or air transit to theater in 40ft transit container or launch strategically from out of theater**

**System operation (1+ Zephyr) requires 5 to launch & rota of 3 monitors**

**Can be managed / controlled in or out of theater via SATCOM**

**User defined standard ground station**

**6 hours pre-flight preparation from transit container (include payload fit and test)**

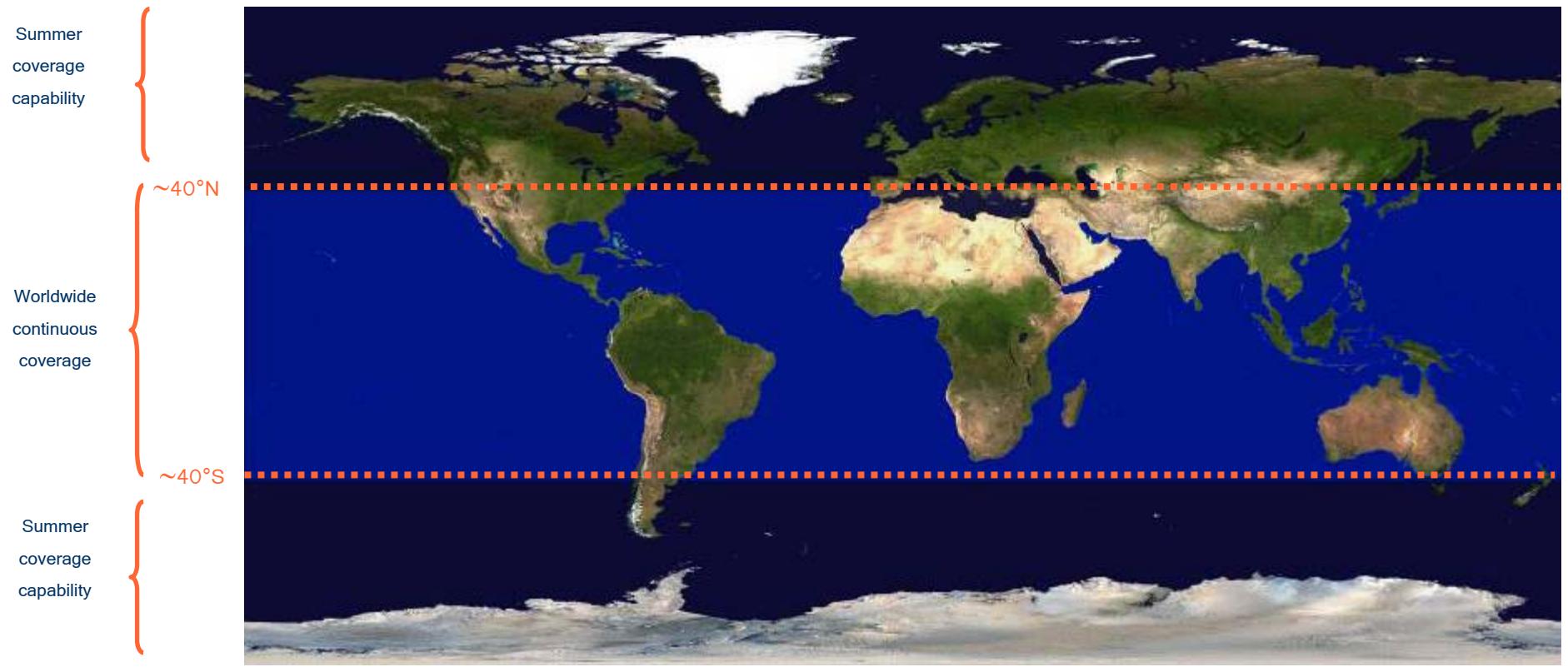
**Launch site: Pre-launched and awaiting tasking**

**Needs flat obstacle free space 50 yards long or ship deck**

**Launch when it suits not when you have to**

**Post-flight maintenance - refurbish in the field**

## Zephyr Operations- Projected year round global coverage capability

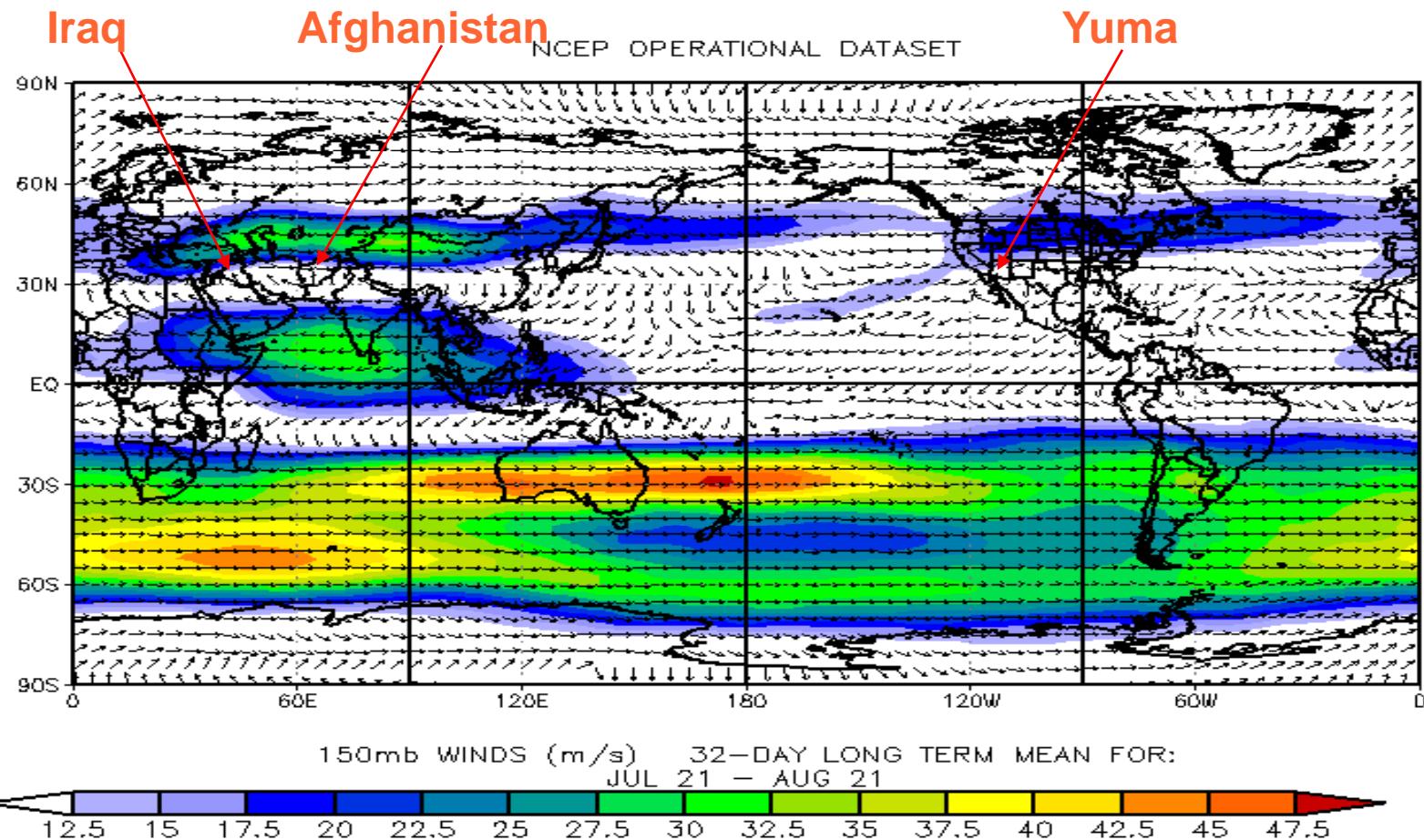


*Improvements in energy storage technology will increase latitude operations from 2010 onwards*

# High level weather

*Back up slide*

August Global Winds 150mb (~46kft)



## **US DoD contact**

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